

fibers and have a core similar in size to that of a conventional optical fiber but may have an outer diameter of 3 mm or more. Such large diameter optical waveguide sensor elements may be formed by using fiber drawing techniques now known or later developed that provide the resultant desired dimensions for the core and the outer dimensions.

[0020] Alternatively, large diameter optical waveguides may be formed by heating, collapsing and fusing a glass capillary tube to a fiber by a laser, filament, flame, etc., as is described in co-pending U.S. patent No. 6,519,388 entitled "Tube-Encased Fiber Grating", which is incorporated herein by reference. Alternatively, other techniques may be used to fuse a fiber to a tube, such as using a high temperature glass solder, e.g., a silica solder (powder or solid), such that the fiber, the tube and the solder all become fused to each other, or using laser welding/fusing or other fusing techniques.

[0021] FIG. 1 illustrates an exemplary system 100 for splicing optical waveguide sections 102 and 104 in accordance with one embodiment of the present invention. As previously described, one or both of the optical waveguide sections may have a larger diameter than conventional optical fibers. For example, for some embodiments, one of the optical waveguide sections may be a large diameter sensor element, while the other optical waveguide section may be a large diameter carrier element used to attach to the large diameter sensor element. For one embodiment, one of the optical waveguide sections may be a large diameter pigtail as described in the commonly assigned co-pending application entitled "Low-Loss Large-Diameter Pigtail" filed herewith (Attorney Docket WEAT/0554).<sup>10/755,722</sup>

[0022] In the illustrated embodiment, the system 100 includes a holding assembly 101 with stages (or fixtures) 103 and 105 for holding the waveguide sections 102 and 104, respectively, within the path of one or more beams 115 from a source laser 110 during a splice process. One or both of the stages 103-105 may be movable in multiple directions (e.g., along X, Y, and Z axes) to control relative position between and allow alignment of the sections 102-104 prior to and during